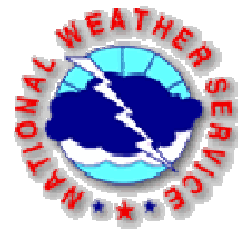




COYOTE CRIER

YOUR SKYWARN NEWSLETTER



Spring/Summer 2012

NATIONAL WEATHER SERVICE TUCSON, ARIZONA

Volume 18, Issue 1

Spotter Training Now Available On-Line

By Greg Mollere, Senior Forecaster and Spotter Training Coordinator

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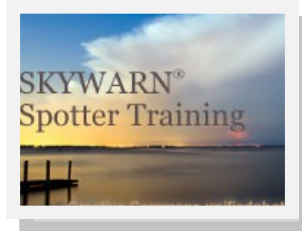
An On-Line Spotter Training course is now available through COMET® MetEd. COMET is the Cooperative program for Operational Meteorology, Education and Training. The COMET® Program was established in 1989 by UCAR (University Corporation for Atmospheric Research) and NOAA's NWS to promote a better understanding of mesoscale meteorology among weather forecasters and to maximize the benefits of new weather technologies during the NWS's modernization program. The COMET mission has expanded, and today COMET uses innovative methods to disseminate and enhance scientific knowledge in the environmental sciences, particularly meteorology, but also including diverse areas such as oceanography, hydrology, space weather and emergency management.

COMET has an outstanding, highly trained team of instructional designers, meteorologists, environmental scientists, graphic artists, multimedia developers, and information technology and administrative professionals. A COMET strength is the flexibility of its staff, which allows effective use of program funds

and efficient production.

The MetEd website provides education and training resources to benefit the operational forecaster community, university atmospheric scientists and students, and anyone interested in learning more about meteorology, weather forecasting, and related geoscience topics. MetEd is populated and maintained by the COMET® Program, which is part of the [University Corporation for Atmospheric Research's \(UCAR's\) Community Programs \(UCP\)](http://www.ucar.edu/Community_Programs/UCP/). The MetEd website is made possible by the sponsors of the COMET® Program.

An on-line Skywarn course has been developed for persons interested in becoming a spotter, or for current spotters that would like a refresher. The first module of this course is called "Role of the Skywarn Spotter" which gives an overview and history of the Skywarn Program. The second module is entitled "Skywarn Spotter Convective Basics". This course will guide users to a basic understanding of convective storms. Through three different scenarios, you will cover reporting and proper



communication of local storm reports to the National Weather Service (NWS), personal safety during these events, and field identification of convective storm hazards. After completing the scenarios, you will be given the opportunity to practice identifying storm features from a spectrum of photos.

For those interested in taking this course, please go to www.meted.comet.ucar.edu/training_course.php?id=23

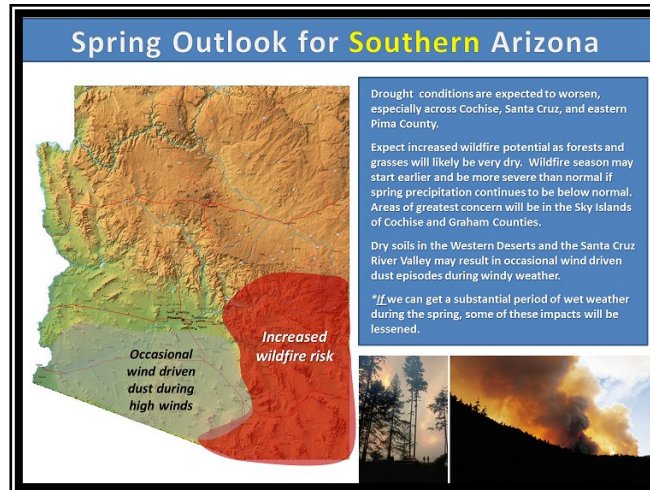
Keep in mind that completion of this course does NOT certify someone to become a spotter for the Tucson Weather Forecast Office. You still have to attend one of the spotter training sessions locally. Refer to the last page of this newsletter for dates and times of upcoming spotter training sessions.





2012 Spring Outlook And Impacts

By Scott Minnick, Meteorologist and Glen Sampson, Meteorologist-In-Charge



tional Airport has only received 0.56 inches so far this year, which is 2.02 inches below normal. As a result, drought conditions are expected to expand and intensify across the region this spring resulting in significant impacts to agriculture, water managers, recreation, and especially the upcoming fire season.

While winter 2011-2012 finished with below normal rainfall, an early winter rainy period resulted in early winter growth. However, this growth is cause for concern as an extended dry period has turned it into dry fuel for fires. Add southern Arizona's prolonged drought, below normal rainfall, below normal snowpack, and low stream levels with abundant fuel and southern Arizona could potentially see another active spring wildfire season. The National Weather Service will continue our key partnership with the Federal land managers to work toward mitigating the wildfire potential. The Tucson National Weather Service Office supplies these land managers with accurate, up-to-date forecasts to warn of critical fire weather conditions. This information is then relayed to the public so proper precautions can be made to avoid a repeat of the 2011 spring fire season.

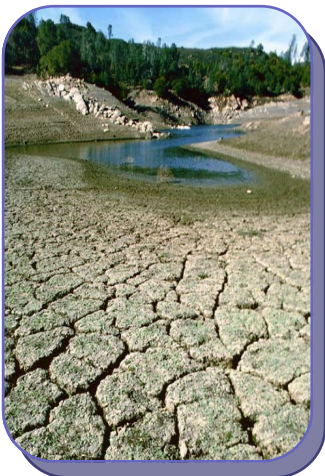
**"DROUGHT CONDITIONS
CONTINUE TO IMPACT
THE STATE WITH 60% OF
ARIZONA EXPERIENCING
AT LEAST SEVERE
DROUGHT CONDITIONS."**

La Niña's presence in the western Pacific Ocean impacted southern Arizona again this past winter with below normal precipitation and warmer than normal temperatures. However, an early season rainy period allowed for more rainfall than the previous winter and also allowed for early winter growth. While La Niña will continue to weaken due to warming sea surface temperatures, the prolonged period of below normal rainfall is forecast to continue this spring.

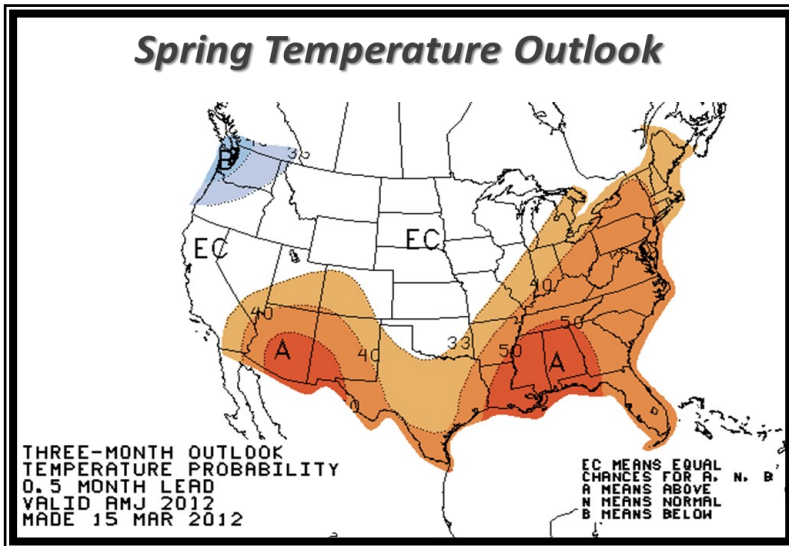
The latest outlook from the Climate Prediction Center (CPC) depicts a large swath of the Southwest under a high probability of receiving above-normal temperatures. What is less known is the probability of receiving above, below, or normal rainfall this spring. CPC's official outlook places southern Arizona under an equal chance (EC) of receiving above-normal or below-

normal rainfall. Spring is the driest time of year for southern Arizona so even normal rainfall will still result in significant drought and fire weather impacts. If southern Arizona did receive a substantial period of wet weather this spring, some of the drought and fire weather impacts could be lessened.

Drought conditions continue to impact the state with 60% of Arizona experiencing at least severe drought conditions. Severe drought conditions first crept into Cochise County toward the end of January 2011 after a very dry 2010-2011 winter season. Southern Arizona has experienced at least severe drought conditions for 14 straight months. An early winter rainy period allowed drought conditions to lessen across the entire region, but severe and extreme drought conditions have crept back into central Arizona. Tucson Interna-



2012 Spring Outlook And Impacts



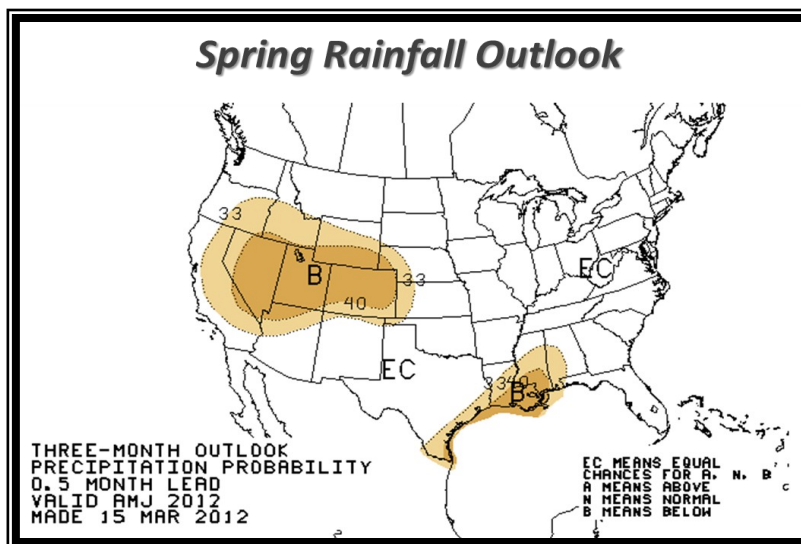
For All Your Weather

Information Needs,

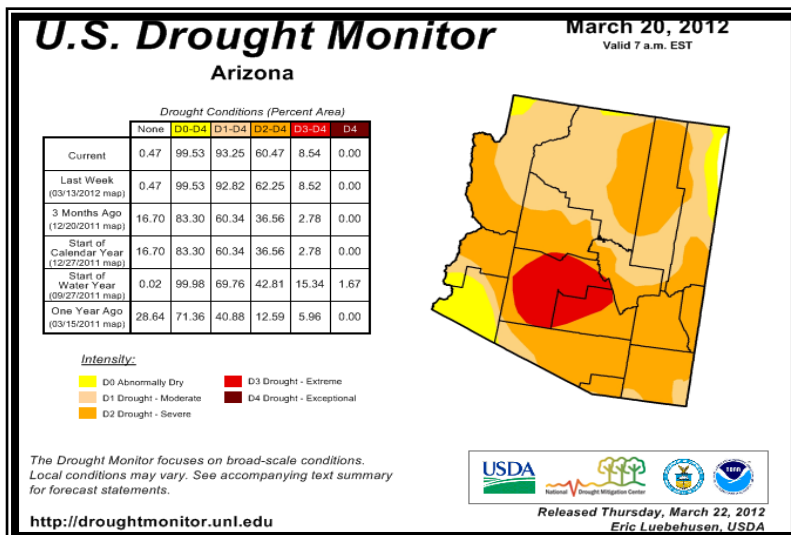
Visit Us On The Web

at

weather.gov/tucson



“SOUTHERN
ARIZONA HAS
EXPERIENCED AT
LEAST SEVERE
DROUGHT
CONDITIONS FOR 14
STRAIGHT MONTHS.”





An Eighteen Wheeler Brings in Pallets of Drinking Water to a Fire.

**“AN INCIDENT
COMMAND POST
(ICP) IS A VERY
BUSY PLACE WITH A
LOT OF PEOPLE
MOVING AROUND”**



These Tents and Trailers Constitute the ‘Kitchen’ on the Three Forks Fire in June 2004.

The Many Headed Hydra of Incident Command

How Many Agencies Pull Together To Fight Wildland Fire

By Steve M. Reedy, General Forecaster, Fire Weather Program Manager and

Incident Meteorologist (IMET)

As many residents of southeast Arizona learned last spring, wildland fire can have a great impact on a neighborhood, even if the fire is seemingly miles away. Evacuations, road closures and other restrictions are just some among many impacts. One of these big impacts is the caravan of fire fighters and other trained personnel assigned to fight the wildfire. While it can be viewed a multitude of ways, from invading hordes of locusts to the heroic approach of the cavalry, the reality is that all these people have to stay somewhere and have needs that must be met in order for them to do their jobs which all contribute to putting the fire out. This leads to the establishment of the Incident Command Post or ICP. This ICP serves as the hub of the wheel, in a manner of speaking, where every person and every activity associated with fighting the fire has its roots there. To continue this wheel metaphor, it is the focus of this article to look at each of the spokes, each division or department that works together in order to contain the fire with minimal threat to lives (of both the crews and local residents), property and other natural resources while also trying to consume as little resources (personnel, equipment and money) as possible.

Operations is the division that encompasses what people typically think of when thinking of wildland fire. These are the fire fighters and their supervisors. These are the “boots on the ground”, “the grunts” or whatever term you prefer. This includes the heavy equipment as well; engines, water tenders, bulldozers and such. This also includes a section of Air Operations, which consists of helicopters and air tankers. Air Ops doesn’t only drop water on the fire from on high though, they also provide eyes in the sky, serving both as reconnais-

sance as well as keeping an eye on crews in the field to make sure that none of them are in any danger. Air Ops can also start fires from on high, helping burnout operations by burning fuels in advance of the fire as a way of controlling where the fire burns.

But Operations just can’t go out there and blindly fight the fire. This is where the Planning section comes in. Recon information from Air Ops, as well as experts in fire-fighting tactics, fire behavior and weather all factor in when devising a plan for Operations to put into action. But Plans does not and cannot stop there. As the old saying goes, “No plan survives the first encounter with the enemy,” and with an environment as dynamic and ever-changing as the fire environment, this holds true for any plan that the Planning section may come up with. So Plans not only comes up with plans, but also monitors conditions and adapts the plan as necessary. If the winds shift, this will impact fire behavior, and if the fire’s behaving differently than what was anticipated, then likely the tactics in fighting it are going to have to change and, with lives on the line, that change will have to come quick! As such, it’s not uncommon to see a fire behavior analyst (FBAN) or an incident meteorologist (IMET) rushing to either Communications or the Incident Commander (IC) in order to get these changes started as quickly as possible.

Speaking of Communications, with so many people either fighting the fire or working on ways to fight the fire, there has to be an exchange, and that’s where Comms comes in. But even that sentence is underselling what they do. Comms isn’t there just for Plans and Ops but for the ENTIRE incident. To stress their importance, many wildland fires occur where there is little or no cell phone coverage. As such, Comms

has to provide a means for everyone on the fire to get in touch with whomever they need to, whether it’s to move crews out of the path of the fire due to a change in winds to the port-a-johns need more toilet paper. This is typically handled by handheld radios and assigned frequencies that Comms has to program every day, as different frequencies are for different functions and divisions. In addition to that, wildfires often occur over great expanses and complex terrain. While these radios can cover a fair amount of distance, sometimes this combination of distance and complex terrain proves to be too much. Thus, Comms is also responsible for installing “repeaters”, units that amplify and retransmit signals that they receive. Thus, while there may be a second or two delay, units on the far side of the fire are able to communicate with ICP just as easily as units considerably closer.

About that toilet paper guy...that’s Logistics. In such a large undertaking as attempting to contain a wildfire, the team needs things to support that objective as well as supporting the people working toward that objective. And it’s more than just toilets and meals. If, as an IMET, I need helium to do a pibal release so that I can help Air Ops, I go to Supply, the storefront for Logistics, order what I need and Logistics makes it happen. Extra sleeping bags for cold nights? Logistics. Gatorade and coolers filled with ice for the crews out there in the heat of the day? Logistics. Nomex, RAWS stations, pens, paper, big or small, specialized or simple, if Logistics doesn’t have it on hand, they deploy shoppers to get it. Put simply, these are the people that make sure that everyone on the fire has what they need to do their jobs.

The Many Headed Hydra of Incident Command

Obviously, getting all that stuff costs money. Having all these people on staff costs money (as everyone involved would prefer to not volunteer their highly specialized services!). Thus, it only makes sense to have a division which only concerns itself with the amount of money being spent. These are the people who keep track of everyone's time on the incident so that everyone gets paid accordingly. Also, the people in Finance work hand in hand with each person's home agency so that everyone gets paid appropriately. No one out on a fire is getting a 300% raise, and Finance makes certain that doesn't happen. They also keep track of how much the resources cost and, in these times of tightening budgets, they're also the ones that do the best they can to find the most economical solutions possible. However, given the emergency nature of wildfires, budget is not the most important thing, it is life and property, and the good folks of Finance always remember that. However, these poor folks are tasked with the thankless job of having to walk that very fine tightrope of having to both save lives and save money. While these next two are separate divisions, they do work hand in hand to ensure that everyone who is sent to help combat wildfire makes it home in one piece. These are Medical and Safety. Safety's job is seemingly self-explanatory. They do their best to create a safe work environment at ICP as well as keeping crews reminded of the dangers they face and how best to minimize those dangers. Stay hydrated, drive at the speed limit and maintain situational awareness are all messages (as well as many MANY more!) that Safety makes sure are at the forefront of firefighters' minds. But no matter how careful or vigilant everyone tries to be, things do happen. That's when

Medical rises to the occasion. Comprised mostly of Emergency Medical Technicians (EMTs), they ensure that anyone hurt in the course of duty gets the treatment they need. But it's not just the big stuff, Medical is there for the small stuff too. Allergy attacks and simple headaches fall under their umbrella just as much as broken bones and burns.

While it was mentioned earlier in this article that wildfires can occur in locations that have little or no cell phone service, it is becoming more and more prevalent that Incident Command Teams bring their own! This falls under the growing branch of Information Technology (IT). On an increasing number of incidents, Command Teams will bring satellite dishes that allow them to connect to the internet. This impacts all the other divisions significantly. With the internet, an IMET can get better weather data or touch base with other forecasters to get a better handle on approaching weather. Logistics can order necessary items with ease. Operations can see what resources are available to them if it looks like they're going to need reinforcements. With the internet, the burden on Comms is lightened as a new channel for communications opens. The vast storehouse of maps on the internet opens up, allowing for better and more detailed planning through Geographic Information System (GIS). This connectivity brings the world so much closer to those on the incident, easing or even accelerating the way in which wildfires are fought.

Lastly, when you have this many people all together in one place, even when everyone is working toward a common and important goal, frictions will begin to occur. It's just human nature. This brings us to Human Resources and the Agency Liaisons. Human

Resources is there to make sure that none of these frictions get in the way of the job at hand. They handle everything from bruised egos to panic attacks. Agency Liaisons perform a similar function, but on a larger scale. As personnel on a fire come from many different agencies (the IMET comes from the National Weather Service, FBANs can come from Bureau of Land Management, Forest Service, state agencies, fire crews come from state or local resources and so on and so on!) these Liaisons make sure that no one agency steps on another's toes and that every agency gets their fair share, whether it's personnel, funding or even credit. Just as Human Resources makes sure that everyone on the incident "plays nice", Liaisons make sure that the agencies contributing personnel "play nice" as well.

An Incident Command Post is a very busy place with a lot of people moving around. With everyone likely wearing very similar attire, the familiar yellow and green nomex, it's difficult to tell who is who. But just because someone you see in that attire doesn't look like a firefighter or barely has any dirt on them while crews coming in off the line are covered in dirt and soot, don't assume that they don't provide a valuable service to the fire. It takes much more than "boots on the ground" and water to effectively and efficiently fight fire, as this article has hopefully explained.

Author's Note: The contents of this article pertain only to Type 1 and Type 2 Incident Command Teams. These are the teams that deal with large fires and fires that threaten the wildland-urban interface. Type 3 and 4 Incident Command teams do not require this amount of resources as they are typically either small fires or fires that pose minimal threat to life or property.



An Aerial View of the Temporary Structures on Three Forks fire That Were Needed to Fulfill the Needs of the Folks Working on the Fire.

**“AIR OPS CAN ALSO
START FIRES FROM
ON HIGH, HELPING
BURNOUT
OPERATIONS BY
BURNING FUELS IN
ADVANCE OF THE
FIRE AS A WAY OF
CONTROLLING WHERE
THE FIRE BURNS.**



A Sky Crane (Helicopter) on the Three Forks Fire.

Community Leaders Discuss Dust Storms and Impacts To Travelers

By Glenn Lader, General Forecaster



A Dust Storm Enters the Phoenix Metro on the evening of July 5th 2011. Photo courtesy Associated Press/The Arizona Republic, Rob Schumacher

**“THE LOCALIZED
DUST EVENTS ARE
WHAT HAVE
CAUSED NUMEROUS
FATAL ACCIDENTS
ON I-10 OVER THE
PAST SEVERAL
YEARS.”**

A meeting held in Casa Grande on March 6th, hosted by the Arizona Department of Transportation (ADOT) and National Weather Service (NWS) offices in Tucson and Phoenix brought about 50 people from a wide and diverse group of vested partners to discuss aspects of the blowing dust problem across southern Arizona. These included impacts to safety (transportation and health), with a goal to develop potential mitigation methods while fostering new or strengthening existing relationships and partnerships.

The meeting was kicked off by Pinal County Supervisor Pete Rios who noted “Nobody wants to own the dust problem” and “whoever assumes responsibility, assumes liability”. Rios had asked Governor Brewer to initiate a blue ribbon task force to look at the dust problem after the 2011 haboobs in Pinal and Maricopa Counties along with fatal accidents on I-10 and come up with some solutions. While the Governor turned down the blue ribbon panel, she did instruct state agencies to continue to work together and this meeting served as an excellent kick start to bring all stakeholders together from academia to state and federal government agencies.

The first portion of the meeting generally reviewed the dust problem across Southern Arizona which occurs during two different types of weather events. The more well-known dust problem occurs in the summer as strong cool outflow winds from thunderstorms that develop near the Tucson area take the path of least resistance downhill towards Phoenix and pickup an abundance of dust causing large haboobs that can extend several thousand feet in the air. This is the kind of event that made international news last summer when a major haboob hit Phoenix on July 5th. Outside of the summer, blowing dust occurs with strong winds from large scale weather systems. These are much more difficult to detect as they tend to occur in localized locations with the generation dependent on factors such as land use and human activity. The localized dust events are what have caused numerous fatal accidents on I-10 over the past several years.

JJ Brost, Science and Operations Officer at NWS Tucson discussed the possibility of putting a small scale meteorological network of wind and visibility sensors about every 5 miles in the known dust regions along I-10 between Tucson

and Phoenix. While this would be useful knowledge to the forecasters at NWS Tucson and Phoenix it likely will not provide much better lead time for these localized dust events. Bill Harmon, ADOT Engineer for the Safford district reviewed ADOT’s role in responding to dust storms and indicated that while dust storm fatalities result from a small percentage of traffic accidents they tend to be major multiple vehicle wrecks. Mike Leuthold, atmospheric scientist from the University of Arizona discussed some modeling initiatives over the longer term that take into account small scale land use that could lead to better forecasts of blowing dust.

With the knowledge from the morning sessions, the afternoon was used to break up the participants into three groups to brainstorm potential short and long term priorities relating to prevention, prediction and detection, and education and response aspects of the dust problem.

The participants will continue to work together post meeting to build on their relationships as they work together on higher priority short and long term priorities.



A 16 car pileup on Interstate 10 between Tucson and Phoenix on Oct. 4th 2011 as a result of reduced visibility due to blowing dust. 1 person was killed and 15 injured. Photo Courtesy Associated Press./Darryl Web

National Weather Service Tucson Office Staff

Meteorologist in Charge.....Glen Sampson

Administrative Support Assistant.....Stephanie Spease

Warning Coordination Meteorologist.....Kenneth Drozd

Science and Operations Officer.....John Brost

Service Hydrologist.....Erin Boyle

Electronic Systems Analyst.....Chris Carney

IT Specialist.....Evelyn Bersack

Electronic Technicians.....Rick Leupold, Keith Sapp

Senior Forecasters.....Jeff Davis, Brian Francis, John Glueck, Jim Meyer, Greg Mollere

Forecasters.....Glenn Lader, Chris Rasmussen, Steve Reedy, Gary Zell

Meteorologist Interns.....Ray McLeod, Scott Minnick

Observation Program Leader.....Mic Sherwood

Hydrometeorological Technician.....Hans Hanson

Monsoon Safety Awareness Week Is June 10-15

Although the monsoon brings welcome rains and relief from the summer heat, the thunderstorms that come with the monsoon bring their own hazards. This is the most dangerous time of year weather-wise in Arizona, so before and during the season, it is a very good idea to review these safety tips:

Lightning:

- If you hear thunder, you are close enough to a storm to be struck by lightning. Go to a safe place immediately! The safest locations are sturdy buildings and metal-topped vehicles.
- Get away from open areas, including ramadas, porches, trees, convertible cars, and swimming pools.
- Plan outdoor activities to avoid being outside between mid afternoon and mid evening, especially in higher elevations where lightning is more common.
- Do not touch any wires or plumbing inside a building
- Remember that it does not have to be raining for you to be struck by lightning. Lightning can strike up to 10 miles away from the nearest thunderstorm!
- Bring pets indoors. Lightning and thunder are very scary for pets, and they are likely to panic or even run away to try and escape the storm.

If someone is struck by lightning, call 911 immediately!

Flash Floods: *Turn Around, Don't Drown!*

Flash floods are common in Arizona. There are thousands of low water crossing and dips which flood every summer. Know where they are, and avoid them during heavy rains.

- Never ever drive into a flooded roadway. The water depth is very easy to misjudge, and the road itself may be damaged or destroyed underneath. It only takes about 1 to 2 feet of water to float most vehicles, including SUVs.
- Never drive around barricades. They are there for a reason – usually because flash flooding is about to take place, is already

happening or the road is damaged by flooding and is unsafe.

- Never allow children to play near washes or storm drains after any rainfall, no matter how light. These flood easily and rapidly, and storm drains are usually so large that children can be swept away.
- Beware of distant thunderstorms, especially if they're over mountains. Flash flooding can occur many miles away from the thunderstorm as the runoff flows into the valleys and deserts.
- Do not camp overnight near streams during the monsoon. Although many of our thunderstorms occur during the afternoon and evening, some of our worst flash floods have occurred in the middle of the night.

Hikers and mountain bikers should try to get out early in the day to avoid the dangers of not only flash flooding, but also lightning. Wherever you are hiking during the monsoon, be aware of your escape routes, follow ranger instructions, and be prepared to move to higher ground quickly.

Dust storms: *Pull Aside And Stay Alive!*

- These are an underrated killer in Arizona! Straight line winds in any thunderstorm can lift huge clouds of dust and reduce visibilities to near zero in seconds, which can quickly result in deadly, multi-vehicle accidents on roadways.
- Dust storms are more common in the early part of the monsoon, near agricultural areas, and near the Willcox Playa in Cochise County. Use caution in these areas any time thunderstorms are nearby.
- If you encounter a dust storm, pull off the road immediately. Turn off your headlights and put your vehicle in "PARK," and take your foot off the brake. Other motorists may tend to follow tail-lights in an attempt to get through the dust storm, and may strike your vehicle from behind.
- Dust storms usually last a few minutes, and up to an hour at

most. Stay where you are until the dust storm passes.

Straight-line winds:

- Thunderstorm wind gusts in Arizona almost always exceed 40 mph. The strongest straight line wind gusts can exceed 100 mph, and can produce damage similar to a tornado! Anytime a thunderstorm approaches, no matter how weak it seems, move indoors to avoid flying debris. Winds rushing down from a thunderstorm can develop very quickly.
- When a Severe Thunderstorm Warning is in effect, it means damaging wind gusts of 58 mph or higher are likely. Move into a central interior room. Stay away from windows.
- Unanchored mobile homes are NOT safe in any severe thunderstorm, and even anchored mobile homes can be heavily damaged in winds over 80 mph. Move to a more sturdy structure.
- Stay away from trees. The vast majority of people are killed or injured in severe thunderstorms by falling trees, from flying debris, or from downed power lines.
- Never touch a downed power line, even if it appears dead. Assume that it is live. Call for help instead.
- Straight line winds can travel dozens of miles away from the thunderstorm that produced them. If the wind suddenly shifts and blows toward you from an approaching storm, while the temperature either becomes much colder or much hotter, the winds are likely to become even stronger. Move indoors!
- Before the monsoon, it is a good idea to either secure loose outdoor furniture and garbage cans, or move them indoors. These are frequently blown around in our summer thunderstorms – even the weakest ones.



Weather Spotter Training Schedule 2012

Date	Time	Location
April 9th (Monday)	6:30 pm	Graham County Admin Bldg. 921 Thatcher Blvd. Safford
April 14th (Saturday)	1:00 pm	U of A Campus 520 N. Park Ave. ENRB Room 253 Tucson
April 24th (Tuesday)	6:00 pm	U of A Campus 520 N. Park Ave. ENRB Room 253 Tucson
May 7th (Monday)	6:30 pm	Santa Cruz County Bldg 2150 N. Congress Dr. Nogales
May 14th (Monday)	6:00 pm	Oro Valley Town Hall 11000 N. La Canada Dr. Oro Valley
May 21st (Monday)	6:30 pm	Sierra Vista Public Library 2600 E. Tacoma St. Sierra Vista
May 24th (Thursday)	6:30 pm	City of Willcox Council Chambers 300 W. Rex Allen Dr. Willcox
June 2nd (Saturday)	2:00 pm	Oro Valley Library 1305 W. Naranja Oro Valley